TABLE 1

Conditions of Circumferential Surface and Grooves of Respective Cooling Rolls.

	Average Width L_1 (μm)	Average Depth L_2 (μm)	Average Pitch L_3 (μm)	Angle θ	Ratio of Projected Area of Grooves with respect to Projected Area of Circumferential Surface (%)	Surface Roughness Ra (μm)
Cooling Roll A	15.0	3.2	30.0	0°	50	0.80
Cooling Roll B	5.0	5.0	12.5	3°	40	1.12
Cooling Roll C	9.2	1.5	10.0	5°	92	0.50
Cooling Roll D	27.0	8.0	90.0	10°	30	2.10
Cooling Roll E	30.0	2.0	50.0	15°	60	0.55
Cooling Roll F	15.0	1.8	20.0	20°	75	0.60
Cooling Roll G	6.4	4.0	8.0	28°	80	0.95
Cooling Roll H	9.5	2.5	15.0	θ_1=15° θ_2=15°	58	0.63
Cooling Roll I	20.0	1.5	30.0	θ_1=10° θ_2=20°	63	0.45
Cooling Roll J	-	-	-	-	-	0.08

TABLE 2

Properties of Melt Spun Ribbons (Sample Nos. 1a to 1e) Example 1

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 1a	Cooling Roll A	1	19	647	0.95	136
		2	20	641	0.95	135
		3	20	645	0.94	133
		4	20	640	0.94	132
		5	19	646	0.95	135
This Invention 1b	Cooling Roll B	1	21	651	0.93	131
		2	20	643	0.94	133
		3	21	640	0.94	131
		4	20	649	0.94	135
		5	20	645	0.93	129
This Invention 1c	Cooling Roll C	1	23	653	0.92	125
		2	22	655	0.93	128
		3	23	651	0.93	127
		4	22	654	0.92	125
		5	21	658	0.93	129
This Invention 1d	Cooling Roll D	1	25	629	0.88	115
		2	21	630	0.88	113
		3	22	631	0.87	112
		4	20	627	0.86	114
		5	25	624	0.88	113
This Invention 1e	Cooling Roll E	1	22	660	0.94	133
		2	21	657	0.94	134
		3	21	655	0.93	129
		4	21	658	0.93	130
		5	22	653	0.94	131

Alloy Composition: $(Nd_{0.7}Pr_{0.3})_{10.5}Fe_{bal.}B_6$

TABLE 3

Properties of Melt Spun Ribbons (Sample Nos. 1f to 1j) Example 1

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m³)
This Invention 1f	Cooling Roll F	1	18	619	0.94	125
		2	19	621	0.94	129
		3	18	625	0.95	131
		4	19	623	0.95	130
		5	19	618	0.94	124
This Invention 1g	Cooling Roll G	1	21	645	0.92	119
		2	21	643	0.92	117
		3	21	647	0.93	125
		4	22	649	0.93	126
		5	23	644	0.93	123
This Invention 1h	Cooling Roll H	1	20	641	0.94	129
		2	22	648	0.92	123
		3	20	643	0.94	130
		4	21	647	0.93	127
		5	22	645	0.92	122
This Invention 1i	Cooling Roll I	1	20	652	0.91	119
		2	22	653	0.92	120
		3	22	657	0.92	121
		4	23	650	0.91	118
		5	21	649	0.91	116
Comp.Ex. 1j	Cooling Roll J	1	18	305	0.80	72
		2	31	393	0.68	58
		3	19	320	0.78	69
		4	21	335	0.75	64
		5	29	380	0.70	60

Alloy Composition: $(Nd_{0.7}Pr_{0.3})_{10.5}Fe_{bal.}B_6$

TABLE 4

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets — Example 1

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 1a	27	642	0.80	96
This Invention 1b	28	643	0.79	94
This Invention 1c	33	650	0.78	92
This Invention 1d	38	625	0.75	85
This Invention 1e	32	653	0.79	94
This Invention 1f	26	616	0.79	93
This Invention 1g	31	640	0.77	90
This Invention 1h	29	639	0.78	92
This Invention 1i	33	648	0.76	87
Comp.Ex 1j.	63	335	0.63	45

Alloy Composition: $(Nd_{0.7}Pr_{0.3})_{10.5}Fe_{bal.}B_6$

TABLE 5

Properties of Melt Spun Ribbons (Sample Nos. 2a to 2e) Example 2

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 2a	Cooling Roll A	1	20	840	0.90	130
		2	20	838	0.90	134
		3	21	832	0.89	133
		4	21	835	0.89	132
		5	21	837	0.89	131
This Invention 2b	Cooling Roll B	1	22	848	0.88	127
		2	21	841	0.89	125
		3	22	846	0.87	129
		4	21	842	0.89	123
		5	22	849	0.88	125
This Invention 2c	Cooling Roll C	1	23	850	0.87	124
		2	22	853	0.88	121
		3	24	846	0.87	125
		4	23	848	0.87	122
		5	24	849	0.88	123
This Invention 2d	Cooling Roll D	1	21	826	0.83	110
		2	26	818	0.81	108
		3	25	820	0.82	109
		4	22	827	0.80	106
		5	23	824	0.81	107
This Invention 2e	Cooling Roll E	1	22	856	0.89	130
		2	22	853	0.88	131
		3	23	849	0.88	126
		4	23	852	0.88	127
		5	22	847	0.89	128

Alloy Composition: $Nd_{11.5}Fe_{bal.}B_{4.6}$

TABLE 6

Properties of Melt Spun Ribbons (Sample Nos. 2f to 2j) Example 2

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 2f	Cooling Roll F	1	20	820	0.89	121
		2	20	815	0.90	122
		3	19	817	0.90	126
		4	20	811	0.88	128
		5	19	814	0.89	127
This Invention 2g	Cooling Roll G	1	23	830	0.88	120
		2	22	833	0.87	119
		3	24	835	0.87	121
		4	22	831	0.88	117
		5	22	829	0.88	120
This Invention 2h	Cooling Roll H	1	22	833	0.89	127
		2	23	838	0.87	124
		3	21	834	0.89	121
		4	23	837	0.87	126
		5	21	835	0.88	120
This Invention 2i	Cooling Roll I	1	24	848	0.87	118
		2	22	850	0.86	115
		3	21	845	0.85	113
		4	23	844	0.86	115
		5	23	846	0.85	117
Comp.Ex. 2j	Cooling Roll J	1	22	380	0.73	61
		2	30	451	0.65	54
		3	19	390	0.71	62
		4	33	462	0.63	50
		5	20	393	0.67	58

Alloy Composition: $Nd_{11.5}Fe_{bal.}B_{4.6}$

TABLE 7

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets

Example 2

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 2a	28	835	0.76	93
This Invention 2b	29	841	0.76	91
This Invention 2c	35	847	0.75	90
This Invention 2d	41	819	0.70	79
This Invention 2e	34	850	0.76	92
This Invention 2f	25	810	0.75	90
This Invention 2g	30	830	0.75	86
This Invention 2h	28	835	0.76	90
This Invention 2i	35	844	0.74	84
Comp.Ex. 2j	67	402	0.56	41

Alloy Composition: $Nd_{11.5}Fe_{bal.}B_{4.6}$

TABLE 8

Properties of Melt Spun Ribbons (Sample Nos. 3a to 3e) Example 3

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 3a	Cooling Roll A	1	21	1072	0.86	128
		2	22	1073	0.86	125
		3	22	1071	0.85	126
		4	22	1075	0.85	124
		5	21	1076	0.86	128
This Invention 3b	Cooling Roll B	1	22	1080	0.85	125
		2	23	1078	0.84	122
		3	22	1075	0.84	124
		4	23	1079	0.85	125
		5	23	1074	0.84	123
This Invention 3c	Cooling Roll C	1	23	1090	0.83	120
		2	25	1085	0.84	117
		3	24	1088	0.82	118
		4	25	1092	0.83	119
		5	24	1087	0.83	116
This Invention 3d	Cooling Roll D	1	27	1063	0.79	110
		2	26	1065	0.79	110
		3	23	1067	0.77	105
		4	24	1064	0.78	108
		5	22	1062	0.78	109
This Invention 3e	Cooling Roll E	1	23	1105	0.85	122
		2	24	1110	0.84	121
		3	24	1101	0.85	123
		4	23	1099	0.84	120
		5	23	1095	0.84	121

Alloy Composition: $Nd_{14.2}(Fe_{0.85}Co_{0.15})_{bal.}B_{6.8}$

TABLE 9

Properties of Melt Spun Ribbons (Sample Nos. 3f to 3j) Example 3

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 3f	Cooling Roll F	1	21	1052	0.85	119
		2	20	1049	0.85	120
		3	21	1056	0.86	121
		4	20	1050	0.86	122
		5	21	1057	0.85	121
This Invention 3g	Cooling Roll G	1	25	1081	0.83	117
		2	23	1079	0.82	115
		3	23	1080	0.82	115
		4	24	1078	0.82	114
		5	23	1076	0.83	116
This Invention 3h	Cooling Roll H	1	24	1078	0.83	122
		2	22	1077	0.82	120
		3	24	1079	0.83	122
		4	22	1080	0.81	119
		5	23	1076	0.83	123
This Invention 3i	Cooling Roll I	1	23	1094	0.82	118
		2	22	1098	0.81	115
		3	24	1093	0.81	116
		4	24	1092	0.82	117
		5	25	1095	0.81	116
Comp.Ex. 3j	Cooling Roll J	1	32	563	0.60	52
		2	18	505	0.65	63
		3	34	572	0.59	53
		4	19	510	0.66	65
		5	22	538	0.62	58

Alloy Composition: $Nd_{14.2}(Fe_{0.85}Co_{0.15})_{bal.}B_{6.8}$

TABLE 10

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets Example 3

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 3a	26	1071	0.72	88
This Invention 3b	29	1075	0.71	86
This Invention 3c	33	1086	0.71	83
This Invention 3d	40	1062	0.66	76
This Invention 3e	33	1096	0.71	85
This Invention 3f	27	1048	0.72	84
This Invention 3g	30	1075	0.70	81
This Invention 3h	30	1077	0.72	83
This Invention 3i	34	1090	0.70	80
Comp.Ex. 3j	70	542	0.52	43

Alloy Composition: $Nd_{14.2}(Fe_{0.85}Co_{0.15})_{bal}B_{6.8}$

TABLE 11

Properties of Melt Spun Ribbons (Sample Nos. 4a to 4e) Comp.Ex.

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
Comp.Ex. 4a	Cooling Roll A	1	18	113	0.78	32
		2	18	109	0.77	29
		3	19	110	0.78	30
		4	19	108	0.78	31
		5	19	111	0.77	31
Comp.Ex. 4b	Cooling Roll B	1	19	115	0.79	33
		2	20	116	0.80	33
		3	19	117	0.80	33
		4	20	113	0.79	32
		5	19	115	0.79	33
Comp.Ex. 4c	Cooling Roll C	1	20	120	0.81	34
		2	22	118	0.80	33
		3	21	121	0.81	34
		4	22	119	0.81	33
		5	21	120	0.81	34
Comp.Ex. 4d	Cooling Roll D	1	24	108	0.72	23
		2	24	106	0.71	22
		3	20	109	0.73	24
		4	21	110	0.73	24
		5	19	107	0.71	23
Comp.Ex. 4e	Cooling Roll E	1	21	125	0.82	36
		2	21	123	0.81	35
		3	20	120	0.81	34
		4	20	128	0.82	36
		5	20	121	0.81	35

Alloy Composition: $Pr_3(Fe_{0.8}Co_{0.2})_{bal.}B_{3.5}$

TABLE 12

Properties of Melt Spun Ribbons (Sample Nos. 4f to 4j) Comp.Ex

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
Comp.Ex. 4f	Cooling Roll F	1	18	101	0.70	18
		2	17	103	0.70	19
		3	18	102	0.70	19
		4	17	104	0.71	21
		5	18	100	0.70	18
Comp.Ex. 4g	Cooling Roll G	1	22	114	0.79	32
		2	20	118	0.80	33
		3	20	115	0.80	33
		4	20	113	0.79	32
		5	21	114	0.79	32
Comp.Ex. 4h	Cooling Roll H	1	21	113	0.79	32
		2	19	112	0.79	31
		3	21	110	0.79	30
		4	19	109	0.78	29
		5	20	112	0.79	32
Comp.Ex. 4i	Cooling Roll I	1	20	123	0.81	34
		2	19	120	0.81	32
		3	21	119	0.81	32
		4	21	125	0.82	35
		5	22	121	0.81	33
Comp.Ex. 4j	Cooling Roll J	1	28	75	0.61	12
		2	18	82	0.62	13
		3	30	70	0.60	12
		4	18	83	0.62	13
		5	20	79	0.62	13

Alloy Composition: $Pr_3(Fe_{0.8}Co_{0.2})_{bal.}B_{3.5}$

TABLE 13

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets Comp.Ex.

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
Comp.Ex. 4a	35	110	0.66	21
Comp.Ex. 4b	37	113	0.67	22
Comp.Ex. 4c	43	118	0.68	23
Comp.Ex. 4d	50	107	0.62	16
Comp.Ex. 4e	39	121	0.68	25
Comp.Ex. 4f	35	100	0.61	15
Comp.Ex. 4g	39	113	0.67	22
Comp.Ex. 4h	42	109	0.67	21
Comp.Ex. 4i	45	120	0.68	24
Comp.Ex. 4j	81	69	0.56	9

Alloy Composition: $Pr_3(Fe_{0.8}Co_{0.2})_{bal.}B_{3.5}$

Fig. 1

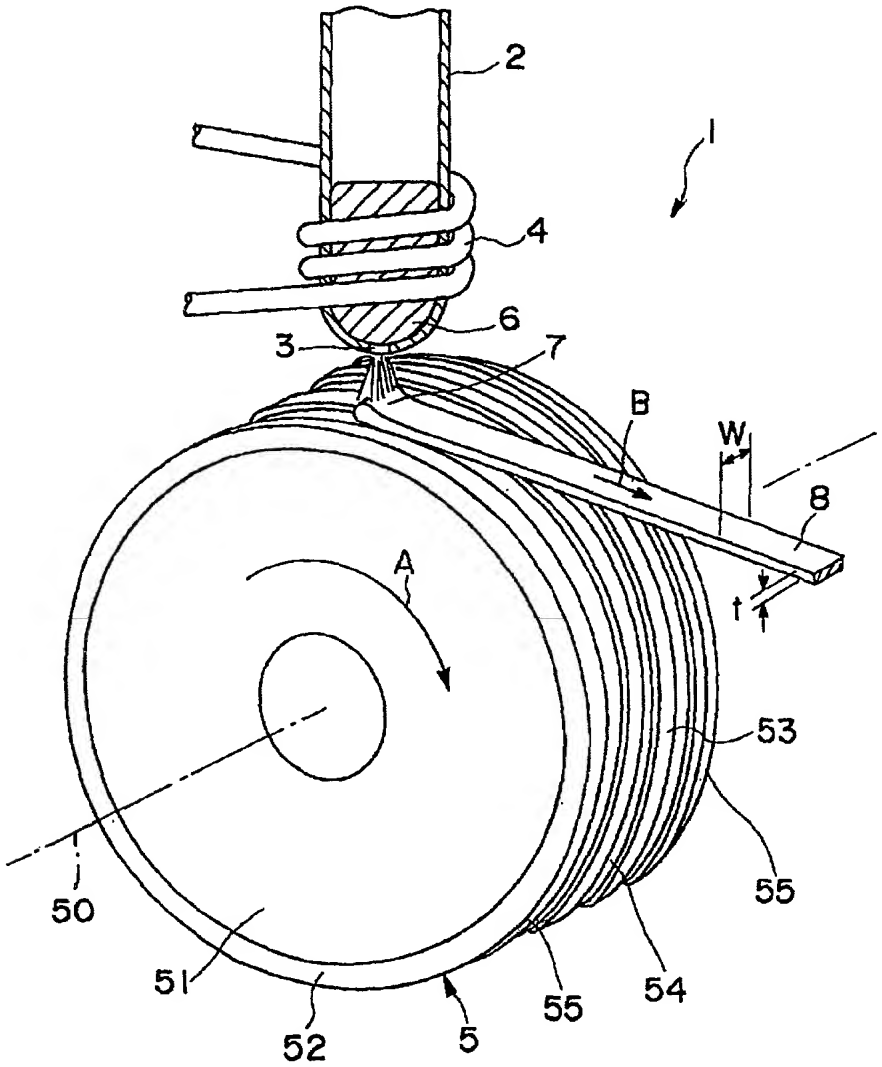

Fig. 2

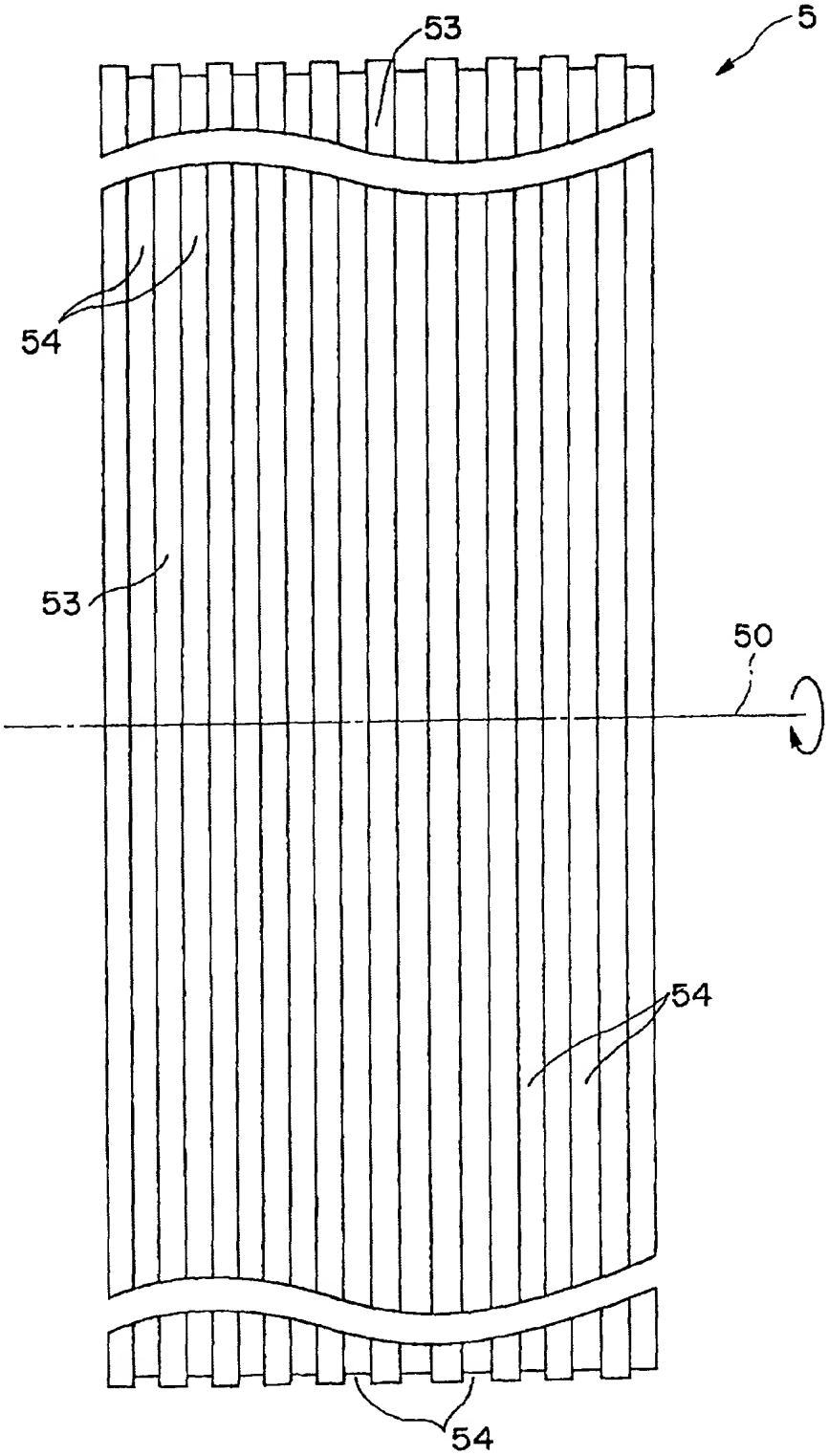

Fig. 3

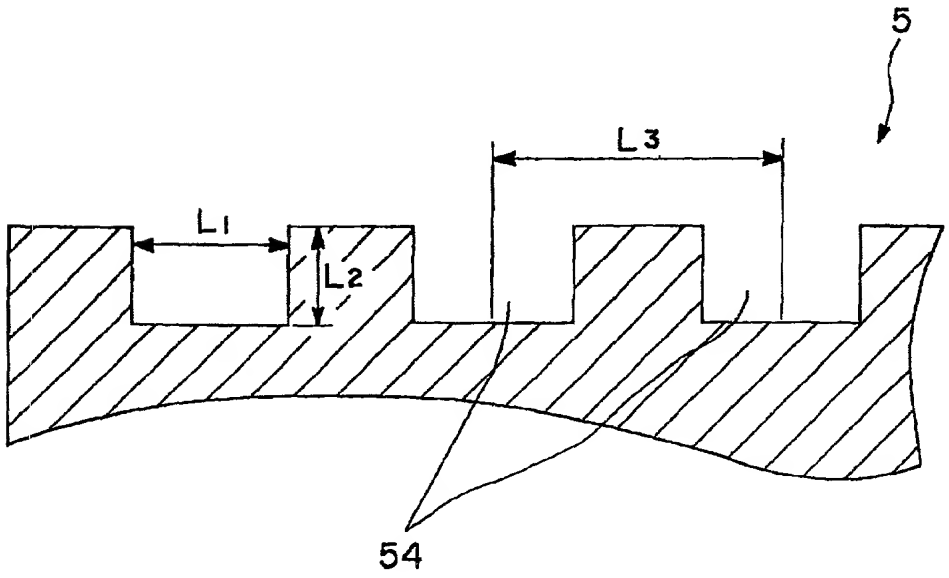

Fig. 4

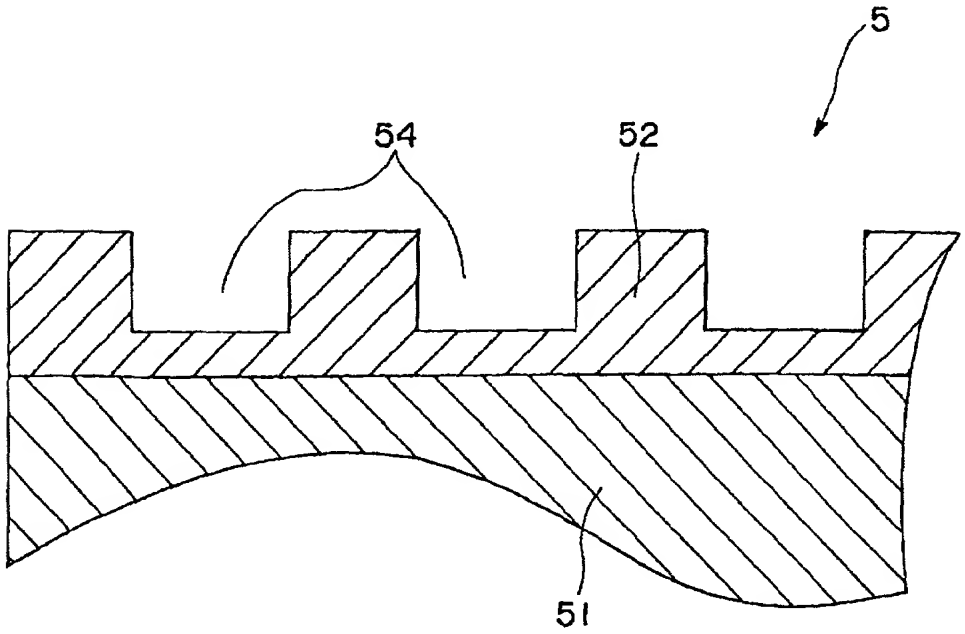

Fig. 5

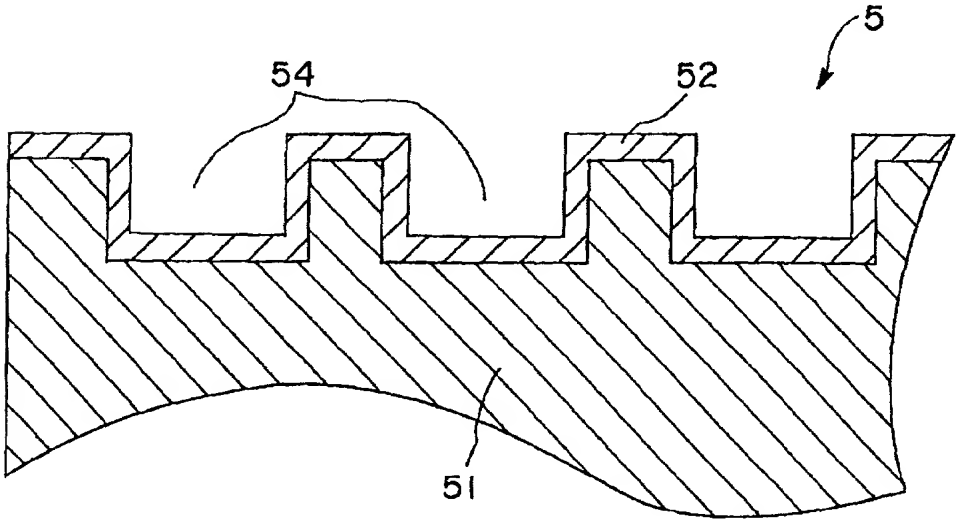

Fig. 6

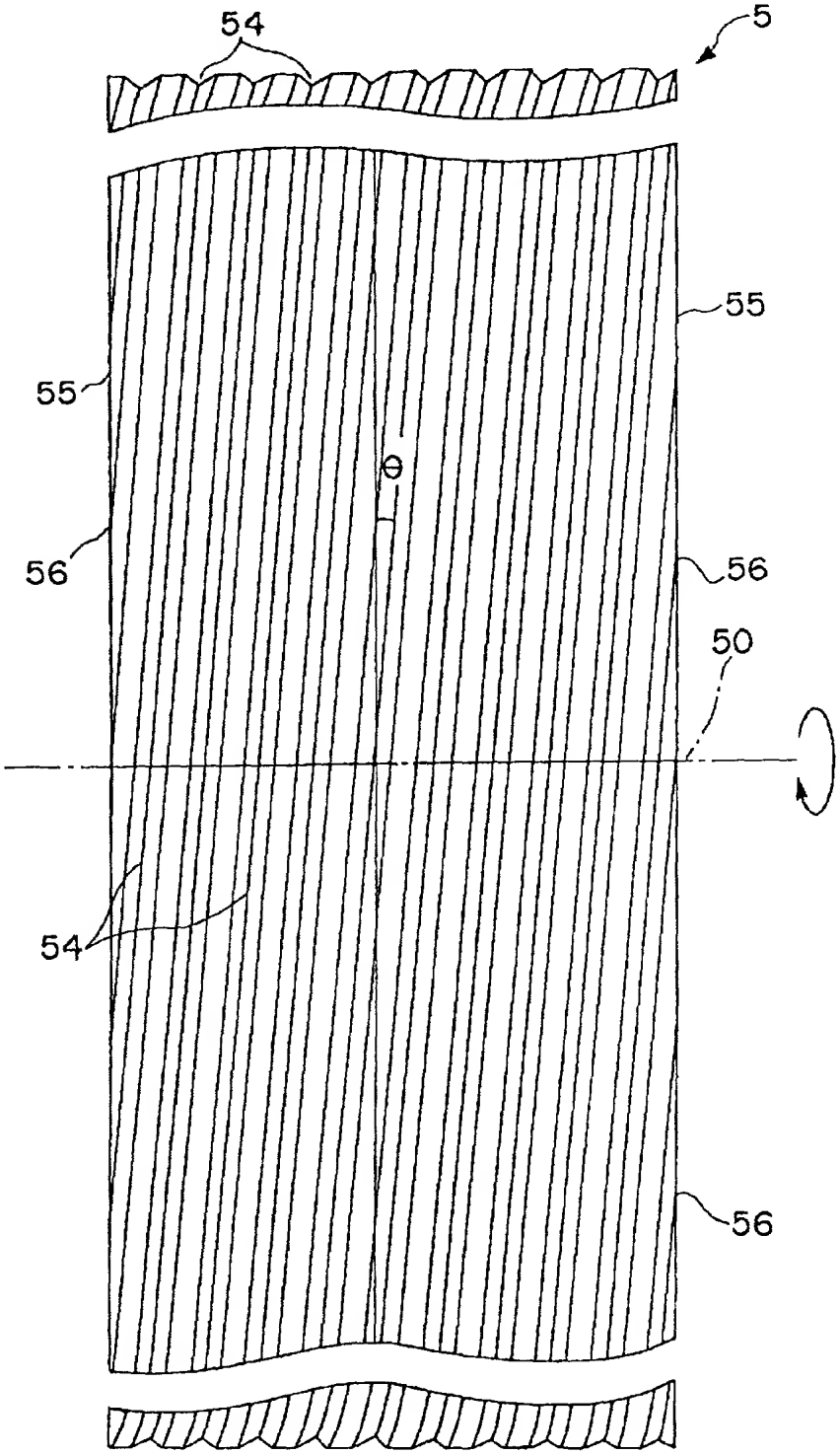

Fig. 7

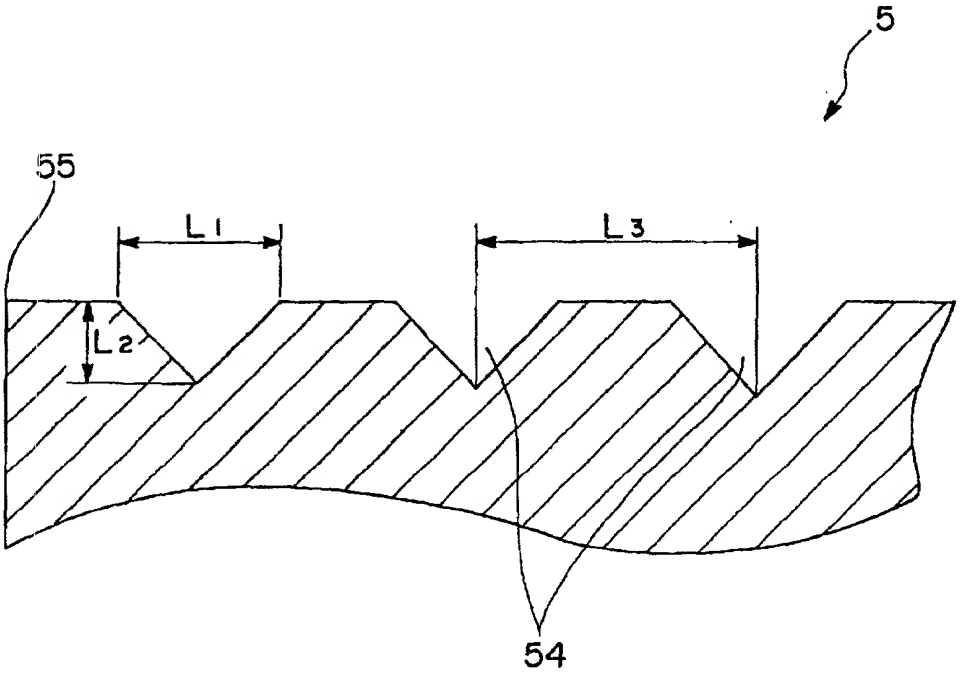

Fig. 8

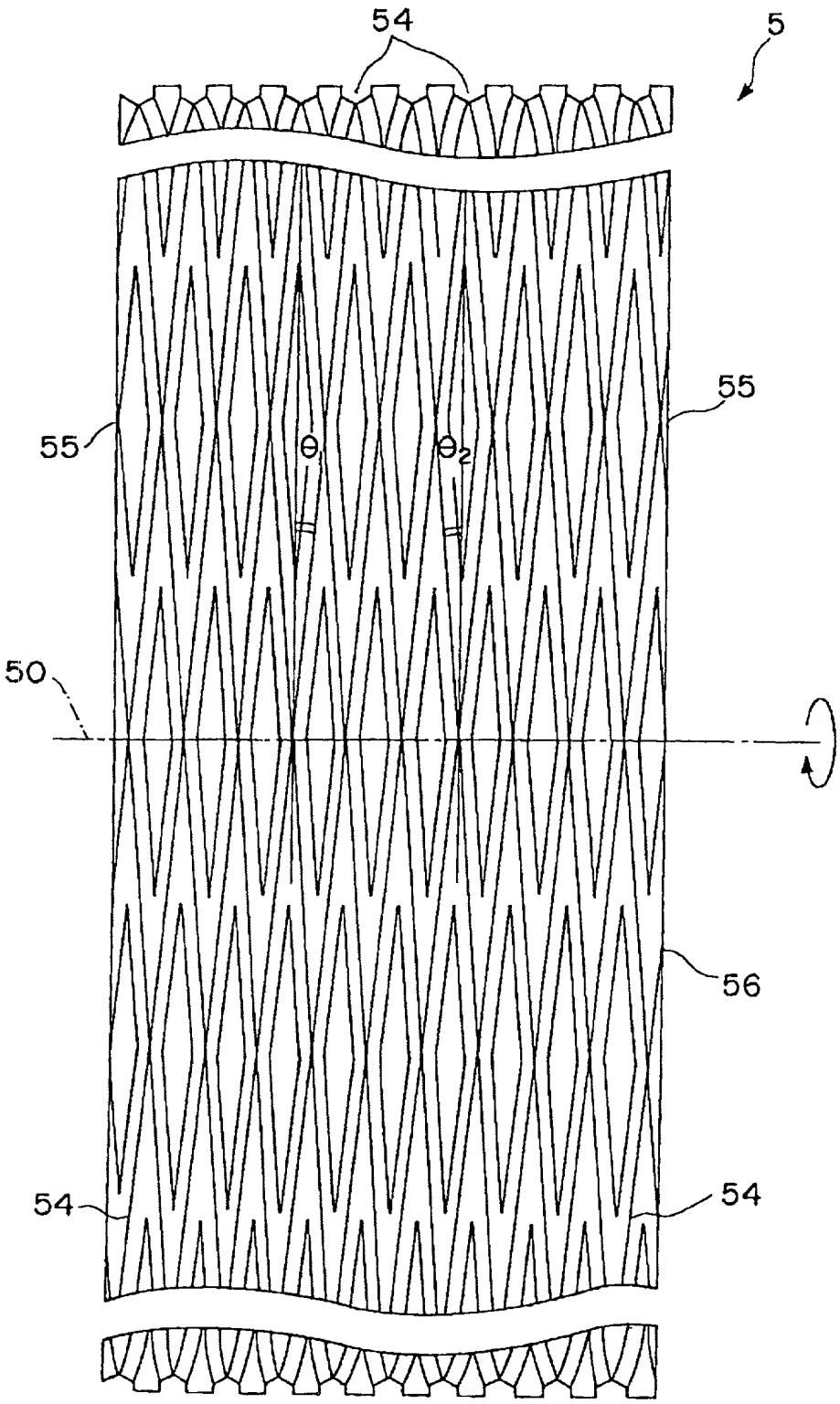

Fig. 9

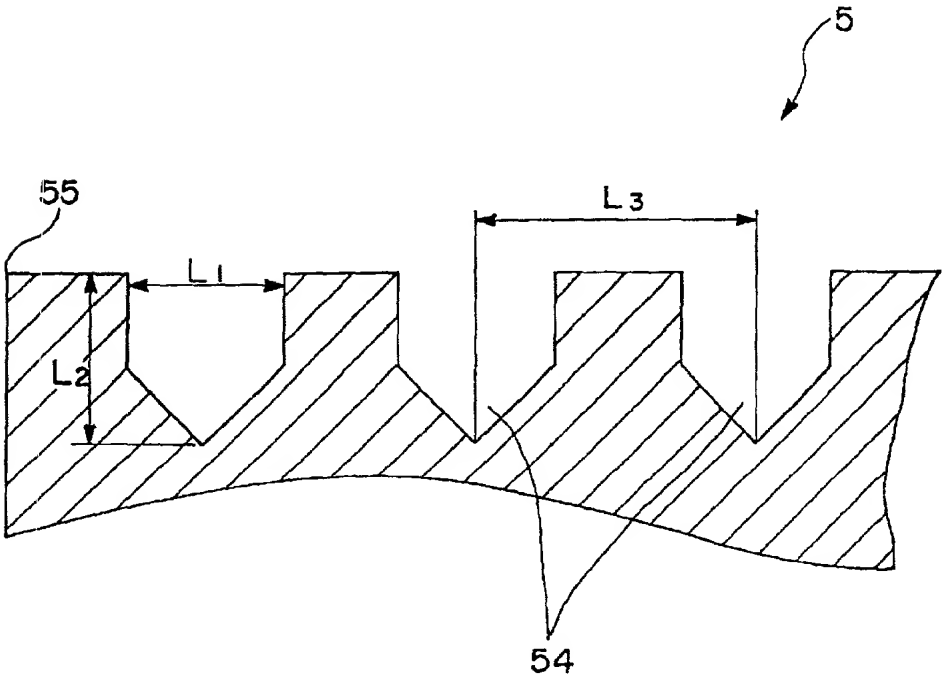

Fig. 10

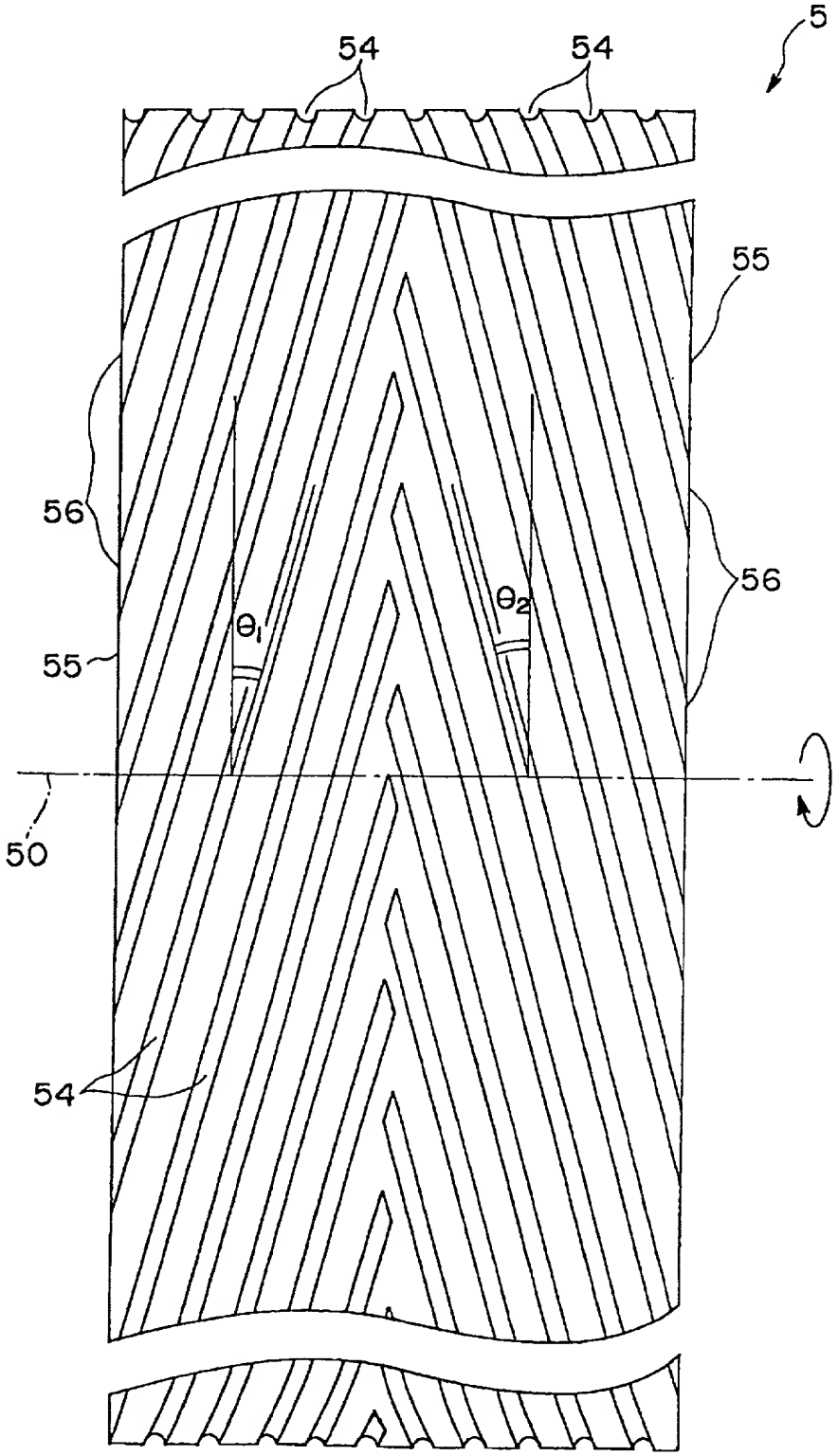

Fig. 11

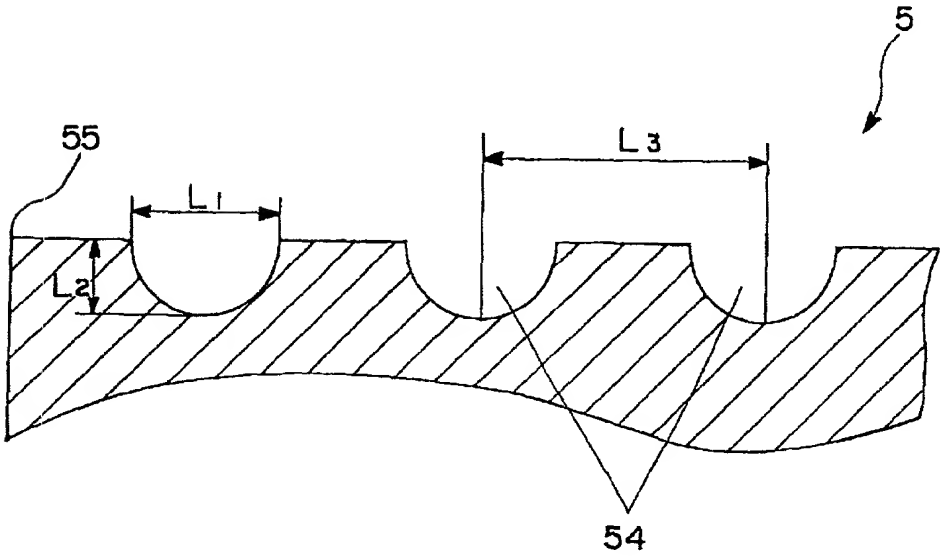

Fig. 12

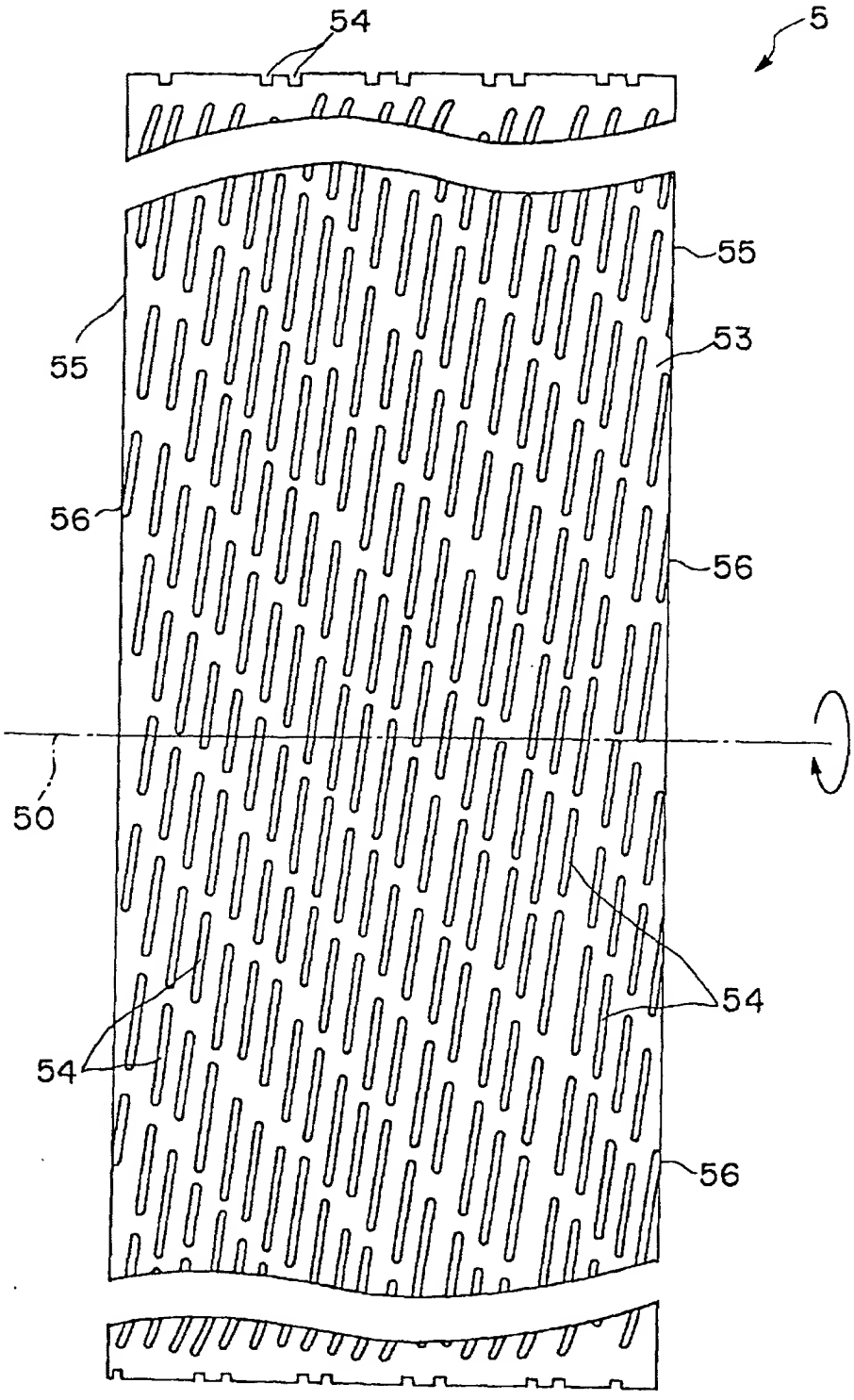

Fig. 13

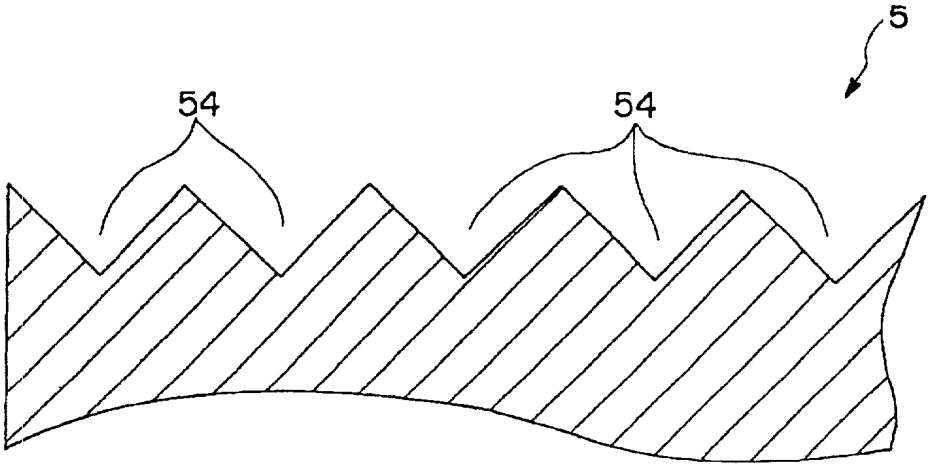

Fig. 14

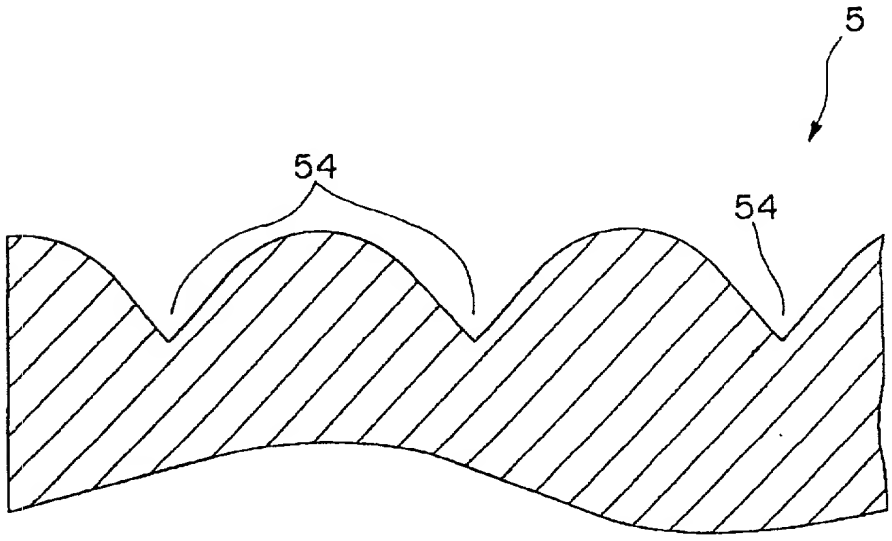

Fig. 15

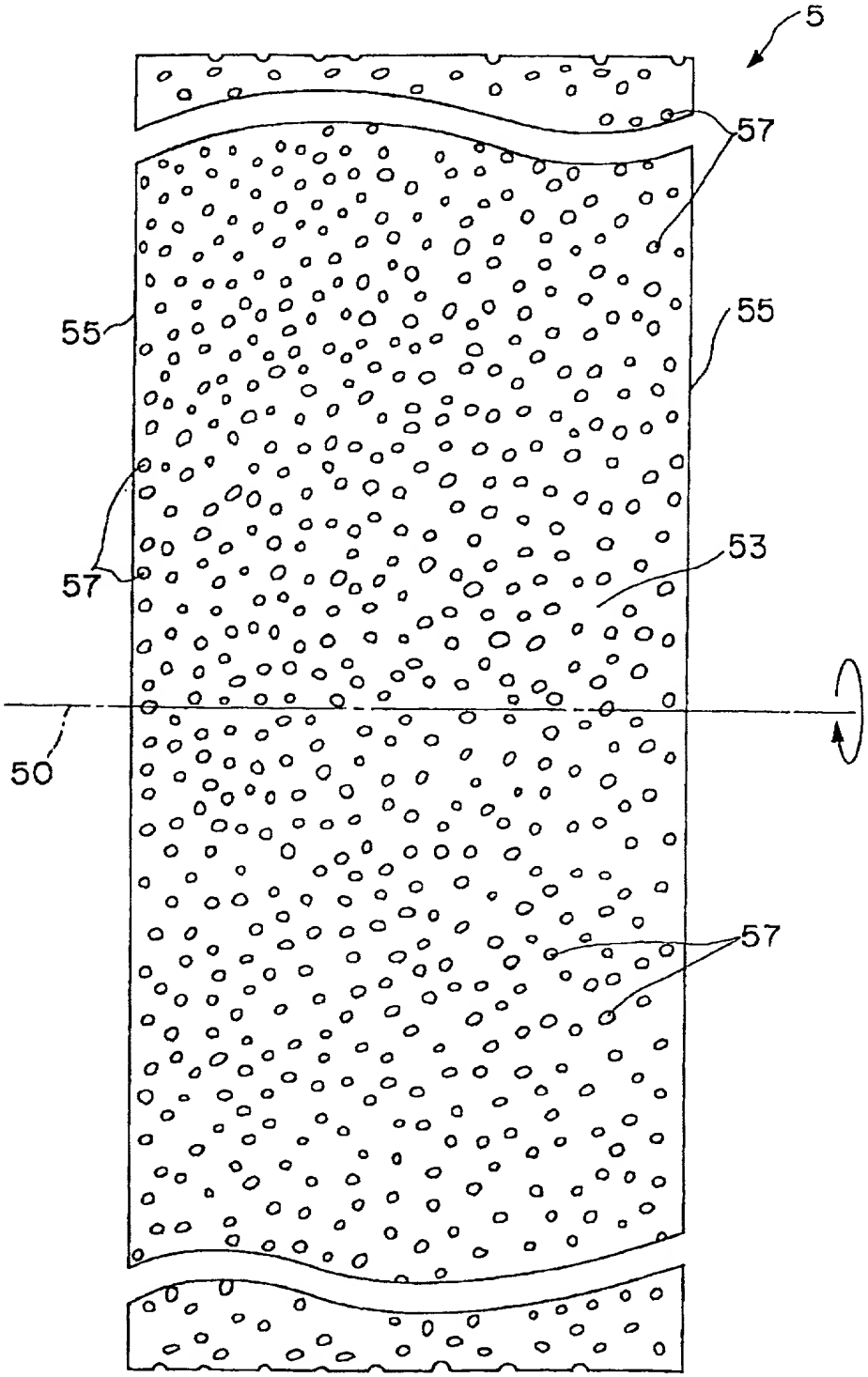

Fig. 16

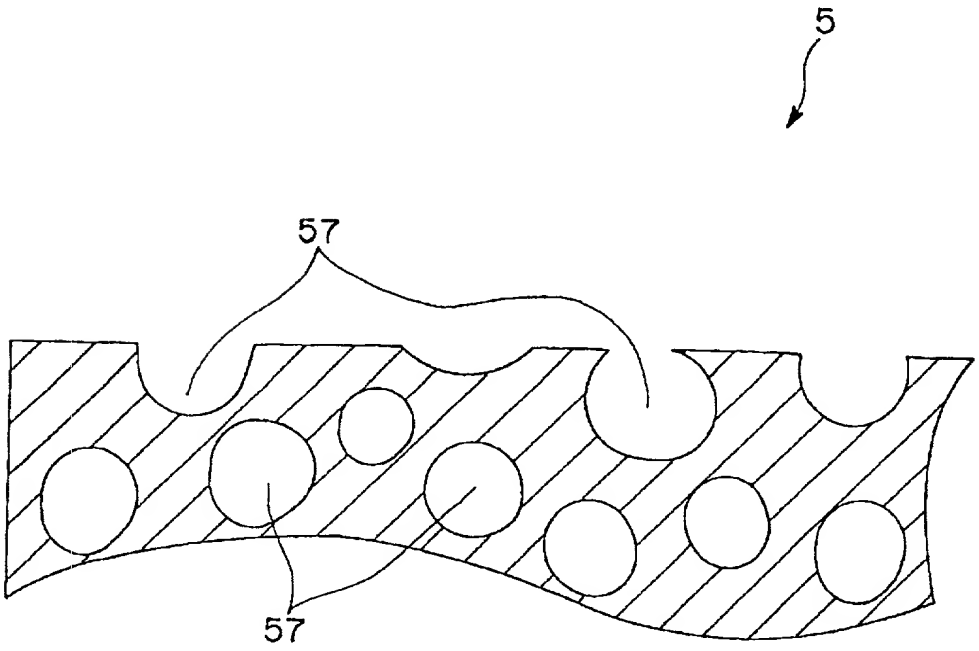

Fig. 17

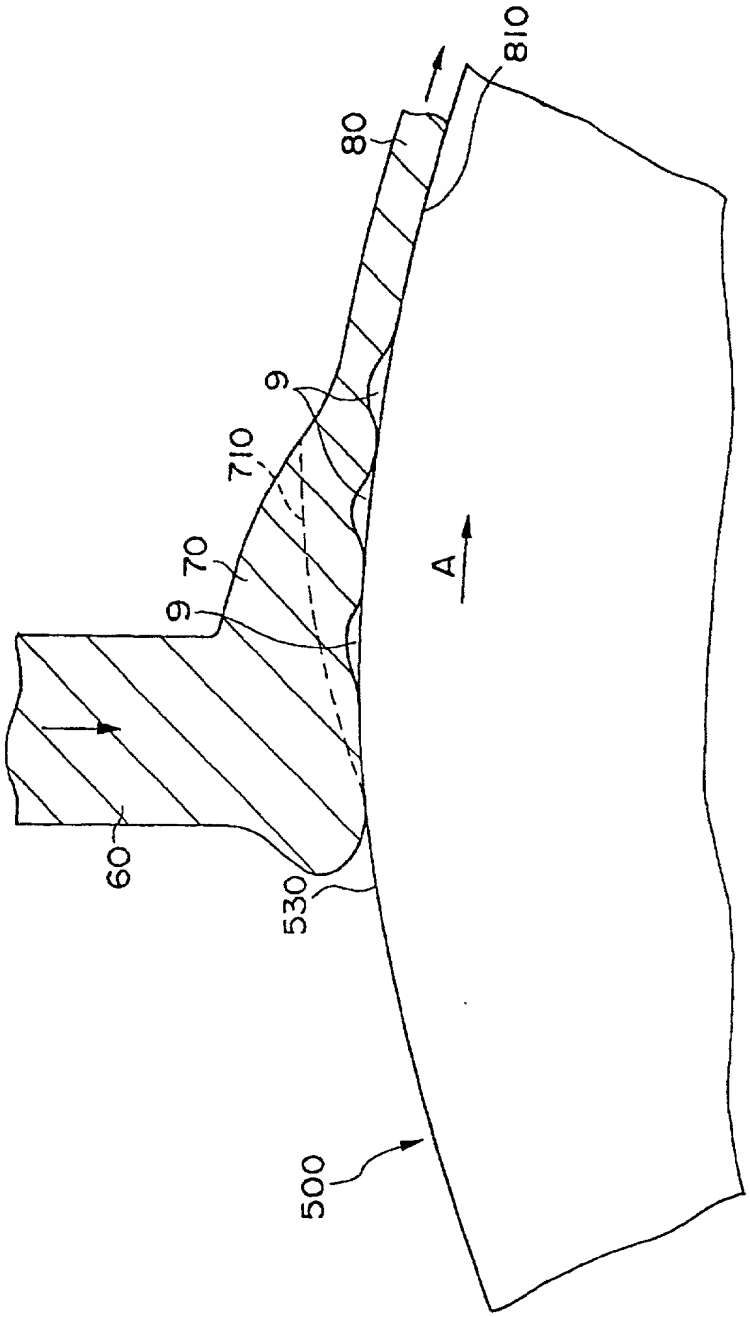

TABLE 1

Conditions of Circumferential Surface and Grooves of Respective Cooling Rolls.

	Average Width L_1 (μm)	Average Depth L_2 (μm)	Average Pitch L_3 (μm)	Angle θ	Ratio of Projected Area of Grooves with respect to Projected Area of Circumferential Surface (%)	Surface Roughness Ra (μm)
Cooling Roll A	15.0	3.2	30.0	0°	50	0.80
Cooling Roll B	5.0	5.0	12.5	3°	40	1.12
Cooling Roll C	9.2	1.5	10.0	5°	92	0.50
Cooling Roll D	27.0	8.0	90.0	10°	30	2.10
Cooling Roll E	30.0	2.0	50.0	15°	60	0.55
Cooling Roll F	15.0	1.8	20.0	20°	75	0.60
Cooling Roll G	6.4	4.0	8.0	28°	80	0.95
Cooling Roll H	9.5	2.5	15.0	θ_1=15° θ_2=15°	58	0.63
Cooling Roll I	20.0	1.5	30.0	θ_1=10° θ_2=20°	63	0.45
Cooling Roll J	-	-	-	-	-	0.08

TABLE 2

Properties of Melt Spun Ribbons (Sample Nos. 1a to 1e) Example 1

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 1a	Cooling Roll A	1	19	647	0.95	136
		2	20	641	0.95	135
		3	20	645	0.94	133
		4	20	640	0.94	132
		5	19	646	0.95	135
This Invention 1b	Cooling Roll B	1	21	651	0.93	131
		2	20	643	0.94	133
		3	21	640	0.94	131
		4	20	649	0.94	135
		5	20	645	0.93	129
This Invention 1c	Cooling Roll C	1	23	653	0.92	125
		2	22	655	0.93	128
		3	23	651	0.93	127
		4	22	654	0.92	125
		5	21	658	0.93	129
This Invention 1d	Cooling Roll D	1	25	629	0.88	115
		2	21	630	0.88	113
		3	22	631	0.87	112
		4	20	627	0.86	114
		5	25	624	0.88	113
This Invention 1e	Cooling Roll E	1	22	660	0.94	133
		2	21	657	0.94	134
		3	21	655	0.93	129
		4	21	658	0.93	130
		5	22	653	0.94	131

Alloy Composition: $(Nd_{0.7}Pr_{0.3})_{10.5}Fe_{bal.}B_6$

TABLE 3

Properties of Melt Spun Ribbons (Sample Nos. 1f to 1j) Example 1

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 1f	Cooling Roll F	1	18	619	0.94	125
		2	19	621	0.94	129
		3	18	625	0.95	131
		4	19	623	0.95	130
		5	19	618	0.94	124
This Invention 1g	Cooling Roll G	1	21	645	0.92	119
		2	21	643	0.92	117
		3	21	647	0.93	125
		4	22	649	0.93	126
		5	23	644	0.93	123
This Invention 1h	Cooling Roll H	1	20	641	0.94	129
		2	22	648	0.92	123
		3	20	643	0.94	130
		4	21	647	0.93	127
		5	22	645	0.92	122
This Invention 1i	Cooling Roll I	1	20	652	0.91	119
		2	22	653	0.92	120
		3	22	657	0.92	121
		4	23	650	0.91	118
		5	21	649	0.91	116
Comp.Ex. 1j	Cooling Roll J	1	18	305	0.80	72
		2	31	393	0.68	58
		3	19	320	0.78	69
		4	21	335	0.75	64
		5	29	380	0.70	60

Alloy Composition: $(Nd_{0.7}Pr_{0.3})_{10.5}Fe_{bal.}B_6$

TABLE 4

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets

Example 1

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 1a	27	642	0.80	96
This Invention 1b	28	643	0.79	94
This Invention 1c	33	650	0.78	92
This Invention 1d	38	625	0.75	85
This Invention 1e	32	653	0.79	94
This Invention 1f	26	616	0.79	93
This Invention 1g	31	640	0.77	90
This Invention 1h	29	639	0.78	92
This Invention 1i	33	648	0.76	87
Comp.Ex 1j.	63	335	0.63	45

Alloy Composition: $(Nd_{0.7}Pr_{0.3})_{10.5}Fe_{bal.}B_6$

TABLE 5

Properties of Melt Spun Ribbons (Sample Nos. 2a to 2e) Example 2

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 2a	Cooling Roll A	1	20	840	0.90	130
		2	20	838	0.90	134
		3	21	832	0.89	133
		4	21	835	0.89	132
		5	21	837	0.89	131
This Invention 2b	Cooling Roll B	1	22	848	0.88	127
		2	21	841	0.89	125
		3	22	846	0.87	129
		4	21	842	0.89	123
		5	22	849	0.88	125
This Invention 2c	Cooling Roll C	1	23	850	0.87	124
		2	22	853	0.88	121
		3	24	846	0.87	125
		4	23	848	0.87	122
		5	24	849	0.88	123
This Invention 2d	Cooling Roll D	1	21	826	0.83	110
		2	26	818	0.81	108
		3	25	820	0.82	109
		4	22	827	0.80	106
		5	23	824	0.81	107
This Invention 2e	Cooling Roll E	1	22	856	0.89	130
		2	22	853	0.88	131
		3	23	849	0.88	126
		4	23	852	0.88	127
		5	22	847	0.89	128

Alloy Composition: $Nd_{11.5}Fe_{bal.}B_{4.6}$

TABLE 6

Properties of Melt Spun Ribbons (Sample Nos. 2f to 2j) Example 2

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 2f	Cooling Roll F	1	20	820	0.89	121
		2	20	815	0.90	122
		3	19	817	0.90	126
		4	20	811	0.88	128
		5	19	814	0.89	127
This Invention 2g	Cooling Roll G	1	23	830	0.88	120
		2	22	833	0.87	119
		3	24	835	0.87	121
		4	22	831	0.88	117
		5	22	829	0.88	120
This Invention 2h	Cooling Roll H	1	22	833	0.89	127
		2	23	838	0.87	124
		3	21	834	0.89	121
		4	23	837	0.87	126
		5	21	835	0.88	120
This Invention 2i	Cooling Roll I	1	24	848	0.87	118
		2	22	850	0.86	115
		3	21	845	0.85	113
		4	23	844	0.86	115
		5	23	846	0.85	117
Comp.Ex. 2j	Cooling Roll J	1	22	380	0.73	61
		2	30	451	0.65	54
		3	19	390	0.71	62
		4	33	462	0.63	50
		5	20	393	0.67	58

Alloy Composition: $Nd_{11.5}Fe_{bal.}B_{4.6}$

TABLE 7

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets Example 2

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 2a	28	835	0.76	93
This Invention 2b	29	841	0.76	91
This Invention 2c	35	847	0.75	90
This Invention 2d	41	819	0.70	79
This Invention 2e	34	850	0.76	92
This Invention 2f	25	810	0.75	90
This Invention 2g	30	830	0.75	86
This Invention 2h	28	835	0.76	90
This Invention 2i	35	844	0.74	84
Comp.Ex. 2j	67	402	0.56	41

Alloy Composition: $Nd_{11.5}Fe_{bal.}B_{4.6}$

TABLE 8

Properties of Melt Spun Ribbons (Sample Nos. 3a to 3e) — Example 3

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m³)
This Invention 3a	Cooling Roll A	1	21	1072	0.86	128
		2	22	1073	0.86	125
		3	22	1071	0.85	126
		4	22	1075	0.85	124
		5	21	1076	0.86	128
This Invention 3b	Cooling Roll B	1	22	1080	0.85	125
		2	23	1078	0.84	122
		3	22	1075	0.84	124
		4	23	1079	0.85	125
		5	23	1074	0.84	123
This Invention 3c	Cooling Roll C	1	23	1090	0.83	120
		2	25	1085	0.84	117
		3	24	1088	0.82	118
		4	25	1092	0.83	119
		5	24	1087	0.83	116
This Invention 3d	Cooling Roll D	1	27	1063	0.79	110
		2	26	1065	0.79	110
		3	23	1067	0.77	105
		4	24	1064	0.78	108
		5	22	1062	0.78	109
This Invention 3e	Cooling Roll E	1	23	1105	0.85	122
		2	24	1110	0.84	121
		3	24	1101	0.85	123
		4	23	1099	0.84	120
		5	23	1095	0.84	121

Alloy Composition: $Nd_{14.2}(Fe_{0.85}Co_{0.15})_{bal.}B_{6.8}$

TABLE 9

Properties of Melt Spun Ribbons (Sample Nos. 3f to 3j) Example 3

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 3f	Cooling Roll F	1	21	1052	0.85	119
		2	20	1049	0.85	120
		3	21	1056	0.86	121
		4	20	1050	0.86	122
		5	21	1057	0.85	121
This Invention 3g	Cooling Roll G	1	25	1081	0.83	117
		2	23	1079	0.82	115
		3	23	1080	0.82	115
		4	24	1078	0.82	114
		5	23	1076	0.83	116
This Invention 3h	Cooling Roll H	1	24	1078	0.83	122
		2	22	1077	0.82	120
		3	24	1079	0.83	122
		4	22	1080	0.81	119
		5	23	1076	0.83	123
This Invention 3i	Cooling Roll I	1	23	1094	0.82	118
		2	22	1098	0.81	115
		3	24	1093	0.81	116
		4	24	1092	0.82	117
		5	25	1095	0.81	116
Comp.Ex. 3j	Cooling Roll J	1	32	563	0.60	52
		2	18	505	0.65	63
		3	34	572	0.59	53
		4	19	510	0.66	65
		5	22	538	0.62	58

Alloy Composition: $Nd_{14.2}(Fe_{0.85}Co_{0.15})_{bal.}B_{6.8}$

TABLE 10

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets Example 3

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
This Invention 3a	26	1071	0.72	88
This Invention 3b	29	1075	0.71	86
This Invention 3c	33	1086	0.71	83
This Invention 3d	40	1062	0.66	76
This Invention 3e	33	1096	0.71	85
This Invention 3f	27	1048	0.72	84
This Invention 3g	30	1075	0.70	81
This Invention 3h	30	1077	0.72	83
This Invention 3i	34	1090	0.70	80
Comp.Ex. 3j	70	542	0.52	43

Alloy Composition: $Nd_{14.2}(Fe_{0.85}Co_{0.15})_{bal}B_{6.6}$

TABLE 11

Properties of Melt Spun Ribbons (Sample Nos. 4a to 4e) Comp.Ex.

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
Comp.Ex. 4a	Cooling Roll A	1	18	113	0.78	32
		2	18	109	0.77	29
		3	19	110	0.78	30
		4	19	108	0.78	31
		5	19	111	0.77	31
Comp.Ex. 4b	Cooling Roll B	1	19	115	0.79	33
		2	20	116	0.80	33
		3	19	117	0.80	33
		4	20	113	0.79	32
		5	19	115	0.79	33
Comp.Ex. 4c	Cooling Roll C	1	20	120	0.81	34
		2	22	118	0.80	33
		3	21	121	0.81	34
		4	22	119	0.81	33
		5	21	120	0.81	34
Comp.Ex. 4d	Cooling Roll D	1	24	108	0.72	23
		2	24	106	0.71	22
		3	20	109	0.73	24
		4	21	110	0.73	24
		5	19	107	0.71	23
Comp.Ex. 4e	Cooling Roll E	1	21	125	0.82	36
		2	21	123	0.81	35
		3	20	120	0.81	34
		4	20	128	0.82	36
		5	20	121	0.81	35

Alloy Composition: $Pr_3(Fe_{0.8}Co_{0.2})_{bal.}B_{3.5}$

TABLE 12

Properties of Melt Spun Ribbons (Sample Nos. 4f to 4j) Comp.Ex

Sample No.	Roll Used in Manufacture of Samples		Average Thickness (μm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
Comp.Ex. 4f	Cooling Roll F	1	18	101	0.70	18
		2	17	103	0.70	19
		3	18	102	0.70	19
		4	17	104	0.71	21
		5	18	100	0.70	18
Comp.Ex. 4g	Cooling Roll G	1	22	114	0.79	32
		2	20	118	0.80	33
		3	20	115	0.80	33
		4	20	113	0.79	32
		5	21	114	0.79	32
Comp.Ex. 4h	Cooling Roll H	1	21	113	0.79	32
		2	19	112	0.79	31
		3	21	110	0.79	30
		4	19	109	0.78	29
		5	20	112	0.79	32
Comp.Ex. 4i	Cooling Roll I	1	20	123	0.81	34
		2	19	120	0.81	32
		3	21	119	0.81	32
		4	21	125	0.82	35
		5	22	121	0.81	33
Comp.Ex. 4j	Cooling Roll J	1	28	75	0.61	12
		2	18	82	0.62	13
		3	30	70	0.60	12
		4	18	83	0.62	13
		5	20	79	0.62	13

Alloy Composition: $Pr_3(Fe_{0.8}Co_{0.2})_{bal.}B_{3.5}$

TABLE 13

Average Crystal Grain Size of Hard Magnetic Phase and Magnetic Properties of Bonded Magnets Comp.Ex.

Sample No. of Melt Spun Ribbons	Average Crystal Grain Size (nm)	H_{cJ} (kA/m)	Br (T)	$(BH)_{max}$ (kJ/m^3)
Comp.Ex. 4a	35	110	0.66	21
Comp.Ex. 4b	37	113	0.67	22
Comp.Ex. 4c	43	118	0.68	23
Comp.Ex. 4d	50	107	0.62	16
Comp.Ex. 4e	39	121	0.68	25
Comp.Ex. 4f	35	100	0.61	15
Comp.Ex. 4g	39	113	0.67	22
Comp.Ex. 4h	42	109	0.67	21
Comp.Ex. 4i	45	120	0.68	24
Comp.Ex. 4j	81	69	0.56	9

Alloy Composition: $Pr_3(Fe_{0.8}Co_{0.2})_{bal}B_{3.5}$